UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

April 28, 1998

Anthony D. Pantaleoni
Vice President
Environment, Health & Safety
Crane Company
100 First Stamford Place
Stamford, CT 06902

SUBJECT: Sampling for Perchlorate at Unidynamics Property

Dear Mr. Pantaleoni:

EPA has recently received information indicating that perchlorate was shipped to the Unidynamics Facility at 102 S. Litchfield Road, in Goodyear, Arizona. Perchlorate (CL04-) is a man-made inorganic salt used as a component of solid rocket fuel in munitions and in the pyrotechnics industry. Currently there is little toxicity data on perchlorate. However, the primary human health concern is perchlorate's known interference with the thyroid gland's ability to property utilize iodine to produce thyroid hormones. I have attached a fact sheet with additional information on perchlorate.

EPA requests that Crane Company sample soil and groundwater at the Unidynamics property for the presence of perchlorate. Please send to EPA and ADEQ, no later than one month from the date of this letter (if possible), a sampling plan and schedule for a perchlorate sampling effort.

Treated groundwater from the Unidynamics facility is not currently utilized for drinking water. However, information on the presence of perchlorate is important at this point to identify all paths of possible exposure to this chemical.

Thank you for your prompt attention to this matter. If you have any questions, please call me at (415) 477-2247.

Sincerely,

Emily Roth
EPA Project Manager

cc:
Craig Cooper, EPA
Arnold Haubenstock, EPA
Kris Kommalan, ADEQ
Kurt Zeppetello, ADEQ
Gerald Ellsworth, SunCor
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Perchlorate in Groundwater and Drinking Water Supply in Region 9

Perchlorate (ClO_4^-) is a man-made inorganic salt used as a component of solid rocket fuel, in munitions and in the pyrotechnics industry. Perchlorate in the form of ammonium perchlorate, potassium perchlorate or sodium perchlorate is essentially as soluble as table salt and easily dissolves and moves through both groundwater and surface water.

Perchlorate has been found in 110 water supply wells in California, at 7 Superfund (NPL) sites (Aerojet and Mather Air Force Base, San Gabriel Valley, NASA-JPL, Edwards Air Force Base, Lawrence Livermore National Lab Site 300 and San Fernando Valley), at 6 other California non-NPL sites, two sites in the Henderson Nevada area, an Army facility in northeast Texas and at one site in Utah. Water suppliers in both northern and southern California, and the Las Vegas Water Authority have found perchlorate in their systems. Perchlorate has also been detected at low levels in the Colorado River as a result of manufacturing activities in Nevada. This potentially affects the water supply of over 1 million people in Nevada, more than 1 million in Arizona, over 10 million people in California as well as Native American tribes along the Colorado.

At this time, the primary human health concern related to perchlorate is that it can interfere with the thyroid gland's ability to properly utilize iodine to produce thyroid hormones. Thyroid hormone deficiencies can affect normal metabolism, growth and development.

Limited Toxicological Data.

Currently, there is limited toxicity data available. A provisional reference dose (RfD) range has been set by EPA, which corresponds to concentrations of 4 to 18 parts per billion (ppb) in water. The contaminant is not regulated by the Safe Drinking Water Act. California's Action Level has been set at 18 ppb. Perchlorate was highlighted as a potential priority contaminant in the October Federal Register notice on the draft drinking water Contaminant Candidate List.

Efforts to obtain additional toxicological data are underway. The Air Force and an industry group are conducting a series of animal toxicological studies. EPA has reviewed and commented on the study protocols. EPA experts will interpret the results as they become available during the spring and summer of 1998 and produce a revised provisional reference dose by September, 1998. EPA will sponsor a review of this analysis by an external panel of scientists to be completed in October 1998.

Need for Treatment Technologies.

Currently, there are no perchlorate treatment systems in operation at any public water supply systems in the United States and there are no known technologies which been demonstrated to be cost-effective for treating large volumes with low concentrations of perchlorate in water supplies. Anaerobic biological systems developed by the Air Force can handle high perchlorate concentration in low volumes, and a biological treatment pilot plant is under construction at the Aerojet Superfund site. Reverse Osmosis is effective but is considered infeasible for large volume water supply applications. The several Ion Exchange technologies tested so far exhibit similar difficulties. Granular Activated Carbon (GAC) has limited effectiveness on perchlorate. One innovative process involving advanced oxidation followed by GAC has shown promise but is still unproven. An electrochemical treatment process is also being investigated.

Research efforts into treatment technologies are through EPA oversight of PRPs, state oversight of PRPs in CA and NV, local water supplier initiative in San Gabriel Valley and an American Water Works Association Research Foundation effort to be funded by $2M of EPA Science and Technology budget. EPA's Cincinnati Office is conducting a review of the technologies through a Region 9 Technical Support request.

Developing an Analytical Method for Use Nationwide

EPA's Las Vegas Laboratory is continuing its evaluation of the analytical protocol developed by the State of California which is capable of detecting the perchlorate ion at 4 parts per billion. The preliminary evaluation is complete and additional work is planned.

Public, Media and Political Interest

The magnitude of the perchlorate contamination in water supply affects a number of stakeholders. Water supply agencies have expressed their strong concern to state and EPA officials and to congressmen and senators. Native American Tribes along the Colorado River have demanded EPA action to protect their water supply. Environmental organizations in California and Nevada are extremely concerned about the threat of a thyroid-disrupting chemical in the water supply. Particular emphasis has been placed on the potential effect on children and developing fetuses, long term effects and the perceived lack of objectivity in toxicological tests conducted by Air Force and industry. The news media has been active particularly in Nevada. Rep. Lewis (R-CA), Sen. Boxer (D-CA) and Sen. Reid (D-NV) have introduced various pieces of legislation seeking solutions to the perchlorate issue, and a number of other legislators have expressed interest.

Background

Perchlorate has been found in California drinking water wells at the Aerojet Superfund site and neighboring Mather Air Force Base site near Sacramento; in Azusa, in the Baldwin Park area of the San Gabriel site; in the Raymond Basin associated with the NASA-JPL site; in the Santa Clarita Basin; in the Redlands area; and in the Rialto area of San Bernardino County. In addition to these, perchlorate has been discovered in groundwater in San Jose, Hollister, Santa Susanna, San Fernando Valley, Lawrence Livermore National Lab Site 300 near Tracy, and Edwards Air Force Base in California. All twelve of these sites appear to be associated with rocket and rocket fuel manufacturing and testing. Very high levels of perchlorate contaminates the groundwater at two sources involved in perchlorate manufacturing near Las Vegas. This contamination is entering surface water flowing into the Colorado River. This potentially affects the water supply of over 1 million people in Nevada, more than 1 million in Arizona, over 10 million people in California as well as Native American tribes along the Colorado. Another rocket manufacturing facility in Utah has contaminated a large private water supply. Perchlorate has been detected in surface water draining from a perchlorate handling area of the Longhorn Army Ammunition facility in Texas. Of the many potential sources of perchlorate contamination around the country from rocket manufacturing operations, few outside Region 9 have been tested for release of perchlorate to water. There are records of shipments of perchlorate to more than different 35 states.

Perchlorate historically has not been considered a common contaminant, and no federal or State drinking water limits exist. EPA has stated that, based on current information, the concentration of 18 ppb of perchlorate in drinking water is adequately protective of pubic health. California Department of Health Services (DHS) has adopted an interim action level for perchlorate of 18 ppb based on a reference dose range developed by EPA. The State of California does not consider perchlorate levels below 18 ppb a health concern for the public, including pregnant women and children. This value was derived from findings in 1992 and 1995 EPA reports which adopted a provisional range corresponding to 4-18 ppb. A bill is pending in the California state legislature to mandate that DHS adopt a state primary drinking water standard for perchlorate by July, 1999.

A summary of perchlorate toxicology and occurrence in California can be found at:
http://www.dhs.cahwnet.gov/dwem/publications/chemicals/perchl/perchlindex.htm

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